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NRCS Natural Resources Conservation Service

2006
Annual Technical Report
James E. “Bud” Smith
Plant Materials Center
Knox City, Texas

September
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James E. "Bud" Smith Plant Materials Center
Knox City, Texas

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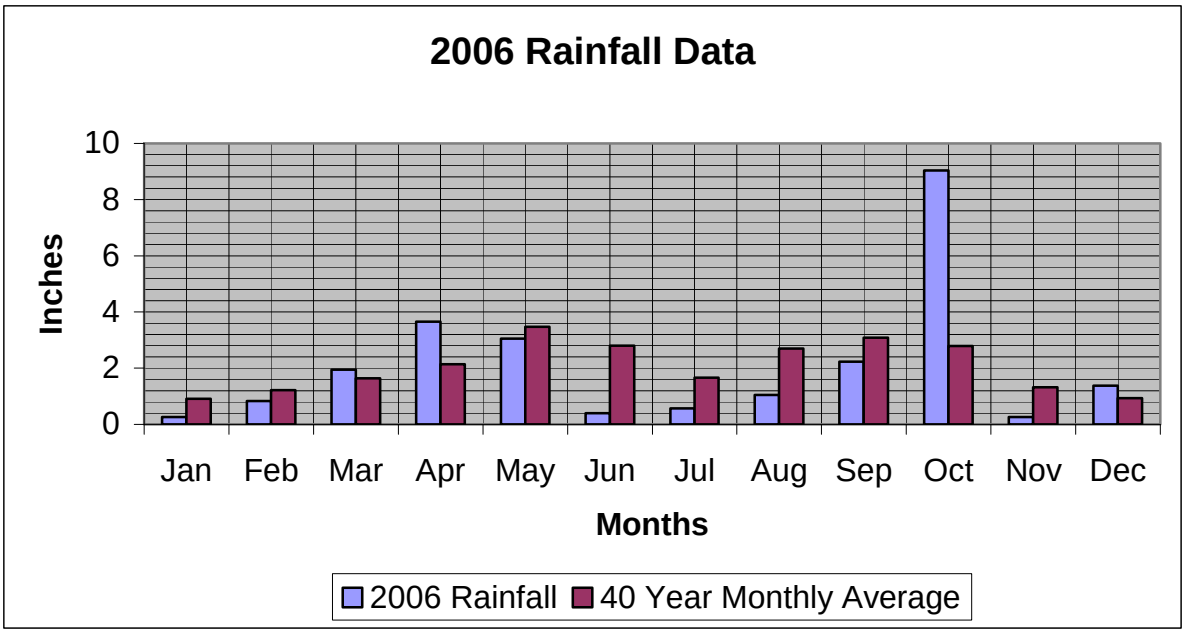
INTRODUCTION

The Natural Resources Conservation Service (NRCS) James E. "Bud" Smith Plant Materials Center (JEBSPMC) near Knox City, Texas, was established in 1965 and is one of 27 Centers located throughout the United States. The Center is responsible for developing conservation plants and cultural techniques for use on targeted Major Land Resource Area (MLRA) in Texas, Oklahoma, Kansas, Colorado, and New Mexico.

The Plant Materials Center is located approximately 4 1/2 miles NW of Knox City, Texas, in the Rolling Red Plains Land Resource Area. The site is located about 33 degrees north latitude, 100 degrees west longitude and 1500 feet above sea level. The facility includes 137.5 irrigated acres. Irrigation water is supplied by eight shallow irrigation wells. All wells are connected to an underground plastic pipeline for distribution to each field.

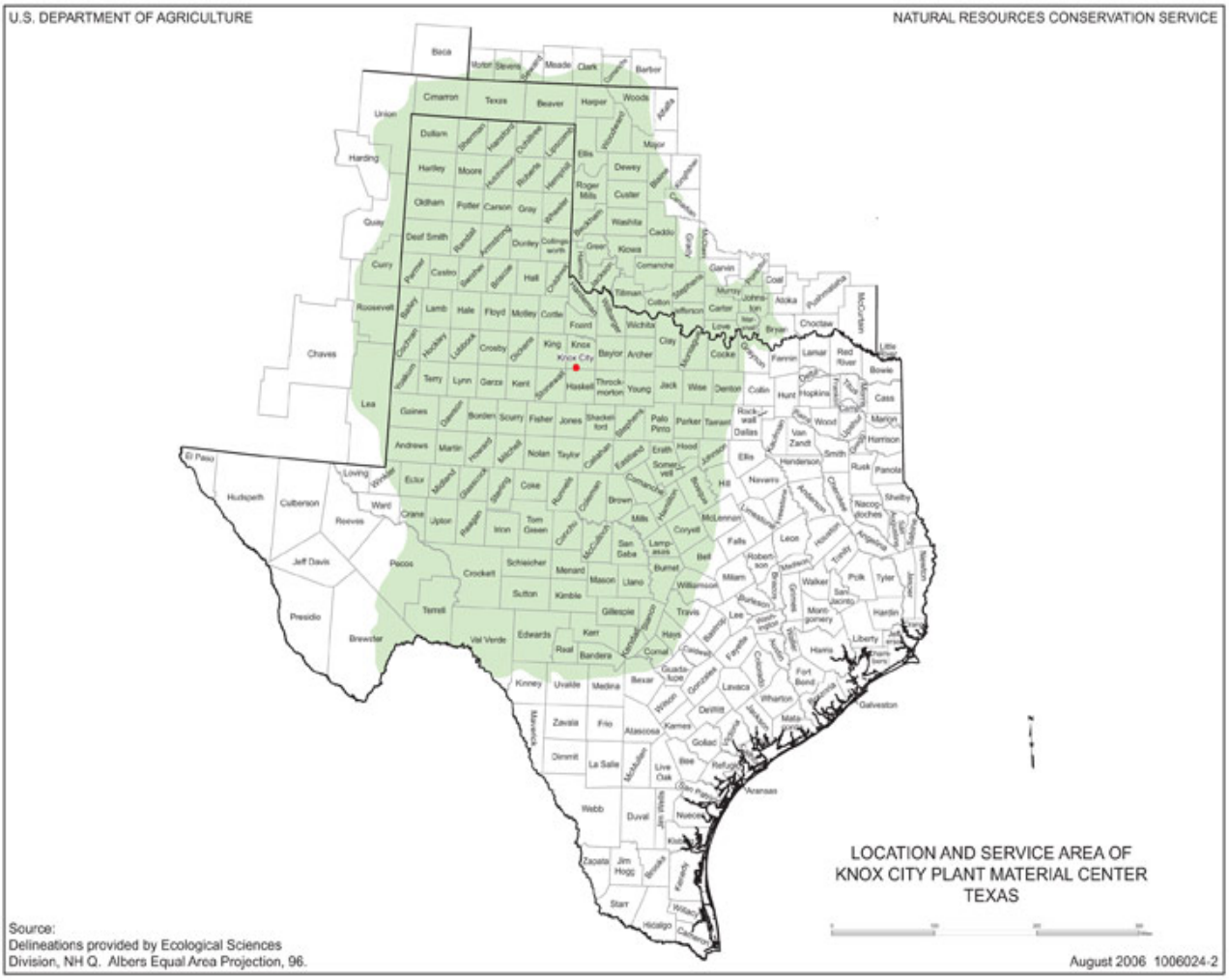
Approximately 90 percent of the soil at the PMC is a friable loam or fine sandy loam. Surface soil varies in depth from 10 to 30 inches with sandy clay loam or clay subsoil. The remainder of the soil is slightly heavier, having a fine sandy loam surface soil over clay loam subsoil with a caliche layer between 20 and 36 inches. Water erosion is not usually a problem but wind erosion poses a constant threat, especially during late winter and spring. On fallow fields, cover crops and tillage practices are applied to control wind erosion.

The PMC has a long term average of 230 frost-free days in its growing season. Rainfall for 2006 was recorded at 24.66 inches, which is average for the 40-year average of 24.66 inches. Precipitation for the Center is mainly received in the form of spring, summer, and fall rain showers. Snowfalls during winter are few and contribute minor amounts to total rainfall.



SERVICE AREA

The service area of the NRCS James E. “Bud” Smith Plant Materials Center (JEBSPMC) includes a large portion of Texas, southwestern Oklahoma, and a portion of Kansas, Colorado, and New Mexico. The work here is coordinated with that being done at other Plant Materials Centers in Texas and throughout the United States. The shady portions of the map below indicate the area of responsibility.



JAMES E. "BUD" SMITH PLANT MATERIALS CENTER LONG RANGE PLAN

I. Introduction

The mission of the Plant Materials Program is to develop and transfer effective state-of-the-art plant science technology to meet customer and resource needs. The purpose of the Plant Materials Program is to carry out specialized activities in resource conservation, as part of the overall program of the Natural Resources Conservation Service. It is the responsibility of the Plant Materials Center to: 1.) assemble, test, and release plant materials for conservation use, 2.) determine techniques for the successful use and management of conservation species, 3.) facilitate the commercial increase of conservation plant species, 4.) provide for the development and transfer of state of the art applied science technology.

The PMC Long Range Plan (LRP) is used to identify, guide, and direct PMC operation toward solving high-priority resource problems identified in the State(s) Plant Materials LRP. **The James E. "Bud" Smith PMC is directed by needs identified in the Long Range Plans of Texas, Oklahoma, Kansas, Colorado, and New Mexico. It is consistent with goals and objectives identified in the NRCS Strategic Plan.**

II. Long Range Plan Development

This Long Range Plan (LRP) was developed in accordance with the revised National Plant Materials Manual, Part 540.22. This plan is intended to be used as a guide for directing plant materials center activities within the state of Texas, portions of Oklahoma, Kansas, Colorado, and New Mexico.

The Plant Materials Center Technical Advisory Committee(s) is responsible for identifying customers, resource, and program needs. The Technical Advisory Committee consists of representatives from NRCS and other federal and state agencies, private industry, and universities. Advisory members may have an interest due to financial contributions made to the center.

Needs were categorized by the NRCS Goals and Objectives as listed in the revised National Plant Materials Manual, Exhibit 539.1, NRCS Goals and Objectives.

The Technical Advisory Committee recommends studies needed at the center to meet identified concerns. Specific study areas and special concerns are defined by the Technical Advisory Committee and reviewed by the State Conservationist Advisory Committee. Projects budgeted are incorporated into the Center's Business Plan and Workload Analysis.

General Description of the Service Area

Climate - USDA Plant Hardiness Zones 5b through 8b are within the area served. Rainfall is quite varied both in annual amount and in seasonal distribution, but predominately occurs in the form of rainfall. Annual precipitation averages of individual climatological stations range from about 12 to 36 inches.

Major Land Resource Areas - Included in the service area is all or portions of eighteen major land resource areas. MLRAs include the following:

67B – Central High Plains, Southern Part
42 – Trans-Pecos
70A – Canadian River Plains and Valleys
70B – Upper Pecos River Valley
77A, B, C, D, E - Southern High Plains
78A, B, C, D - Central Rolling Red Plains
80A - Central Rolling Red Prairies
80B - North Texas Central Prairies
81A, B, C, D - Edwards Plateau
82A, B - Texas Central Basin
83A – Northern Rio Grande Plain
83B – Western Rio Grande Plain
84A - Cross Timbers
84B - West Cross Timbers
84C - East Cross Timbers
85 - Grand Prairie
86A - Northern Texas Blackland Prairies
87B – Texas Claypan Area, Northern Part

A detailed description of MLRAs, land use, and climate may be found in the reference "Land Resource Regions and Major Land Resource Areas of The United States", Agricultural Handbook 296.

III. NRCS Objectives, Needs, Recommended Actions

The plant material needs of the James E. “Bud” Smith PMC fall into five categories according to NRCS Objectives:

NRCS Objective: 2.1 Healthy and productive cropland sustaining U.S. agriculture and the environment.

A. Plant selection and cultural technique development for stabilization of soils that have high erosion potential.

Problem:
Plant materials are needed that have the innate ability to establish and maintain themselves on sandy soils and control wind erosion. Three major land resource areas in Oklahoma and sixteen MLRA's in Texas are affected, resulting in a total of 4.7 million acres needing attention.

Objective:
To identify, collect, develop technology, and cooperatively release plant selections and techniques for the stabilization of sandy soils with high erosion potential.

Procedure:
Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and at selected off-center sites.

Previous releases:
'Mason' sandhill lovegrass
'Alamo' switchgrass
'Rainbow' wild plum
'Lometa' Indiangrass
'Haskell' sideoats grama
'Sabine' Illinois bundleflower
'Comanche' partridge pea
'Van Horn' green sprangletop
'Earl' big bluestem
Potter County Germplasm spike dropseed
Borden County Germplasm sand dropseed
Cottle County Germplasm sand bluestem
OK Select Germplasm little bluestem
Hondo Germplasm velvet bundleflower
Cuero Germplasm purple prairie clover

Current plant science studies:
Evaluation of giant sandreed
Evaluation of prairie acacia
Evaluation of Havard panicum

B. Woody species for wind erosion control and wildlife habitat.

Problem:
Adapted woody plant materials that are easily established, fast growing and long-lived are needed for windbreaks. In addition to erosion control, windbreaks will provide wildlife habitat and enhance beautification of the landscape. Nine major land resource areas in Texas and five in Oklahoma are involved.

Objective:
To identify, collect, develop technology, and cooperatively release plant selections and techniques for use in windbreak planting and design.

Procedure:
Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and at selected off-center sites.

Previous releases:
'Rainbow' wild plum
'Yellow Puff' littleleaf leadtree
'Boomer' bur oak

Kerr Germplasm Wright pavonia

Current plant science studies:
Evaluation of white honeysuckle

Objective 2.2 Healthy watersheds providing clean and abundant water supplies for people and environment.

A. Ground cover vegetation for critically eroding areas to reduce soil loss and improve water quality.

Problem:
There is a need for plant materials and techniques for stabilization of critically eroding areas. All major land resource areas in both states totaling approx. 2.5 million acres are affected need vegetative treatment.

B. Objective:
To identify, collect, develop techniques, and cooperatively release adapted vegetation for stabilization of critically eroding areas.

Procedure:
Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and at selected off-center sites.

Previous releases:
'Texoka' buffalograss
'Alamo' switchgrass
'Aztec' Maximilian sunflower
'Rainbow' wild plum
'Saltalk' alkali sacaton
'Haskell' sideoats grama
'Sabine' Illinois bundleflower
'Comanche' partridge pea
'Van Horn' green sprangletop
'Overton R18' rose clover
'Earl' big bluestem
Potter County Germplasm spike dropseed
Borden County Germplasm sand dropseed
Duck Creek Germplasm Texas dropseed
Cottle County Germplasm sand bluestem
Hondo Germplasm velvet bundleflower
Cuero Germplasm purple prairie clover

Current plant science studies:
Evaluation of prairie acacia
Evaluation of Havard panicum
Evaluation of prairie cordgrass
Evaluation of purpletop

C. Plant selection and cultural techniques for saline and/or alkaline soil conditions.

Problem:
There is a need for adapted plant materials, which are tolerant of saline and/or alkaline soil conditions. All major land resource areas in Texas and four in Oklahoma, totaling more than 1.2 million acres, are affected by different levels of salinity or alkalinity that are either naturally occurring or induced by oil field related activities. (See respective long-range Plant Materials Programs - Oklahoma and Texas).

Objectives:
To identify tolerant materials and techniques for saline or alkaline sites by:

---testing known cultivars for their adaptability.
---collect and evaluate of plants from sites.
---evaluating techniques needed to enhance establishment.
---release adapted plants and techniques.

Procedure:
Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and at selected off-center sites.

Previous Releases:
'Selection 75' kleingrass
'Alamo' switchgrass
'Aztec' Maximilian sunflower
'Lometa' Indiangrass
'Saltalk' alkali sacaton
'Haskell' sideoats grama
Potter County Germplasm spike dropseed
Borden County Germplasm sand dropseed
Duck Creek Germplasm Texas dropseed

Current plant science studies:
Evaluation of Havard panicum
Evaluation of prairie cordgrass

Objective 2.3 Healthy and productive grazing land sustaining U.S. agriculture and the environment.

A. Species selection and cultural technique development needed for the enhancement of water quality, improvement of range and pastureland and to promote food and cover for wildlife.

Problem:
There is a need for commercially available adapted plant materials indigenous to the climates of Texas, Oklahoma, Kansas, Colorado, and New Mexico. All major land resource areas in these states need treatment with locally adapted plants.

Adapted species are needed to help improve water quality, provide forage for wildlife during critical periods and provide food/cover for wildlife.

Objective:
To identify, collect, develop, and cooperatively release grasses, forbs, legumes, and woody species adapted to Oklahoma and Texas.

Procedure:
Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and at selected off-center sites.
Previous releases
'Selection 75' kleingrass
'Mason' sandhill lovegrass
'Alamo' switchgrass
'Aztec' Maximilian sunflower
'T-587' old world bluestem
'Rainbow' wild plum
'Lometa' Yellow Indiangrass
'Yellow Puff' littleleaf leadtree
'Saltalk' alkali sacaton
'Haskell' sideoats grama
'Sabine' Illinois bundleflower
'Comanche' partridge pea
'Plateau' awnless bushsunflower
'Van Horn' green sprangletop
'Overton R18' rose clover
'Earl' big bluestem
Kerr Germplasm Wright's pavonia
San Marcos Germplasm eastern gamagrass
Cottle County Germplasm sand bluestem
OK Select Germplasm little bluestem
Hondo Germplasm velvet bundleflower
Cuero Germplasm purple prairie clover

Current plant science studies:
Evaluation of sweet Indianmallow
Evaluation of white honeysuckle
Evaluation of prairie cordgrass
Evaluation of purpletop
Evaluation of prairie acacia
Nutritional Evaluation of Perennial Species for Deer Food Plot

Objective 2.4 Healthy and productive wetlands sustaining watersheds and wildlife.

A. Wetland vegetation selection and cultural techniques for water quality improvement.

Problem:
There is a need for plant materials and techniques that are adapted for water quality use. All major land resource areas in both states are affected and need adapted species. Urban and rural wastewater treatments, streambank stabilization and drinking water quality improvement are major concerns in the area.

Objective:
To identify, collect, develop techniques, and cooperatively release adapted vegetation for water quality improvement.

Procedure:
Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and at selected off-center sites.

Released Plant Materials
'Alamo' switchgrass
'Aztec' Maximilian sunflower
'Rainbow' wild plum
'Haskell' sideoats grama
'Sabine' Illinois bundleflower
'Comanche' partridge pea
'Van Horn' green sprangletop
'Earl' big bluestem
San Marcos Germplasm eastern gamagrass

Current plant science studies:
Evaluation of prairie acacia
Evaluation of prairie cordgrass
Technical evaluation of bushy bluestem
Technical evaluation of purpletop

Planned collections and studies:
Technical Evaluation of alkali bulrush
Technical Evaluation of waterwillow
Technical Evaluation of sawgrass

Objective 2.5 High-quality habitat on private land supporting the Nation's wildlife heritage.

A. Species selection and cultural technique development needed to promote food and cover for wildlife.

Problem:
There is a need for commercially available adapted plant materials indigenous to the major land resources in Texas, Oklahoma, Kansas, Colorado, and New Mexico.

Objective:
To identify, collect, develop and cooperatively release grasses, forbs, legumes, and woody species adapted to Texas, Oklahoma, Kansas, Colorado, and New Mexico for wildlife.

Procedure:
Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and selected off-center sites.

Previous released species, assemblies under evaluation and cultural studies will be evaluated at the center and at selected off-center sites.

‘Alamo’ switchgrass
‘Aztec’ Maximilian sunflower
‘Rainbow’ wild plum
‘Yellow Puff’ littleleaf leadtree
‘Sabine’ Illinois bundleflower
Hondo Germplasm velvet bundleflower
Cuero Germplasm purple prairie clover
Kerr Germplasm wright pavonia
‘Boomer’ bur oak
‘Plateau’ awnless bushsunflower
‘Eldorado’ Engelmanndaisy

Current plant science studies:
Evaluation of prairie acacia
Evaluation of prairie cordgrass
Technical evaluation of purpletop

Study Number and Name: 48I117S Evaluation of western indigo
Study Objective: Evaluation and release of selected accessions of western indigo.

Study Number and Name: 48I136K Evaluation of little walnut
Study Objective: Evaluation and release of selected accessions of little walnut.

Study Number and Name: 48I156H Evaluation of giant sandreed
Study Objective: Evaluation and release of selected accessions of big sandreed.

Study Number and Name: 48I171K Evaluation of white honeysuckle
Study Objective: Evaluation of selected species foe wildlife use

Study Number and Name: 48I179B Native Plants for Big Bend National Park
Study Objective: Increase and production of native plants and seeds for BBNP.

Study Number and Name: 48I183B Native Plants for Chickasaw National Recreation Area
Study Objective: Native plant and seed production for CNRA

Study Number and Name: 48I187J Evaluation of Indianmallow
Study Objective: Evaluate and release selected accessions of Indianmallow

Study Number and Name: 48I188S Evaluation of halfshrub sundrop
Study Objective: Evaluation and release selected accessions of halfshrub sundrop

Study Number and Name: 48I190S Evaluation of Havard panicum
Study Objective: Evaluation and release of selected accessions of Havard's panicum.

Study Number and Name: 48I192S Evaluation of prairie acacia
Study Objective: Release of selected accessions of prairie acacia.

Study Number and Name: 48I193S Technical evaluation of prairie cordgrass
Study Objective: Release of tech. information on the production and use of prairie cordgrass.

Study Number and Name: 48I195S Evaluation of bushy bluestem
Study Objective: Evaluation and release of bushy bluestem for wildlife habitat in wetlands.

Study Number and Name: 48I196S Evaluation of purpletop tridens
Study Objective: Evaluate and release accessions of purpletop for wildlife habitat

Study Number and Name: 48I202J Nutritional Evaluation of Perennial Species for Deer Food Plots
Study Objective: Evaluate perennial species for deer food.

Study Number and Name: TXPMC-T-0601-RA Growth Curve Study
Study Objective: Forage Production, Nutritive Quality and Growth Pattern of Warm Season Grasses under Low and High Fertility Management,

Study: 48I117S Assembly of Information in the Release of PI 477963 Western indigo

Objective: To document information for release of PI 477963 western indigo to be used as a forage legume in range mixtures in West Central Texas.

Project Plan – Since 1983, field plantings of western indigo including PI477963 had been conducted at 10 locations in Texas. During the 5-year period, not one of the plantings obtained a successful stand.

Supplement #1- In the spring of 1988 a ground preparation with a seeding mix of PI-477963 western indigo, 'Haskell' Sideoats grama, '29926T' Little bluestem, 'Lometa' Indiangrass and '441106' Green sprangletop were planted in the north end of R block at the Plant Materials Center. West side non-scarified western indigo seeds and east side scarified western indigo seeds. Irrigation vs. non-irrigation for both non-scarified and scarified seeds was applied. Results were that of the western indigo there were more plants per square foot of non-scarified seeds on irrigated and non-irrigated than scarified seeds on irrigated and non-irrigated plots.
On May 27, 1992, thirteen accessions of western indigo were planted at the Plant Materials Center to be evaluated. This included PI 477963 which is 04134T, also. Through the duration of this study all 13 accessions were evaluated and the overall results are listed below.

Accession	# of Plants Germinated	# of Plants Survived	Vigor	% Stand	Uniform Early Greenup
64848	1	1	7	1	5
64876	1	1	5	1	9
49540	1	1	5	1	5
PI 477963	1	1	3	1	5
64851	7	1	7	1	5
64896	7	3	7	1	5
64855	3	1	7	7	5
9002535	1	1	4	3	5
49554	1	1	7	3	1
64866	1	1	7	1	1
9002528	3	1	5	1	1
49636	3	1	5	1	1
64886	3	1	5	1	1

Rating: 1-Excellent / 3-Good / 5-Fair / 7-Poor / 9-Very Poor / 0-None

49540 – Caldwell Co., Texas
49554 – Freestone Co., Texas
49636 – Coke Co., Texas
64848 – Caldwell Co., Texas
64851 – Parker Co., Texas
64855 – Bell Co., Texas
64866 – Comal Co., Texas
64876 – McLennan Co., Texas
64886 – Guadalupe Co., Texas
64896 – Smith Co., Texas
9002535 – Hidalgo Co., Texas
9002528 – Medina Co., Texas
477963 – Knox Co., Texas

Summary: Have discontinued this study.

Study: 48I136K Evaluation of little walnut, *Juglans microcarpa*

Objective: To evaluate assemblies of little walnut, *Juglans microcarpa*, for windbreaks and shelterbelts, wildlife food and cover, beautification, or other conservation purposes as determined.

Supplement #1 - Two accessions of little walnut (9013188 from Oklahoma and 9013187 from Kansas) were established on the PMC in 1970, and would provide a base for evaluation activities. In 1980 and 1981 collections were made and 12 additional accessions were placed into the evaluation. All accessions were started from seed in nursery plots, grown for one year and transplanted as bare-root stock into three field trial sites. Sites were established in 1983-84 at Knox City PMC (Southern Rolling Plains), Pampa, TX (Southern High Plains - heavy soils), and Levelland, TX (Southern High Plains - sandy soils).

Supplement #2 - After 10 years of evaluation three selections PI-477964 (9013187), Hays, Kansas; PI-477966 (9013188), Carter, OK; and 9028147 Nolan, Co., TX have been selected and will be further evaluated as potential releases.

Supplement #3 - PI-477964 from Hays, KS seems to be the top candidate for release. Seed collected and produced at the Texas Forest Service Nursery, Lubbock, TX has proven to have excellent germination and good seedling vigor.

15 Years Total Growth at Three Locations

Acc. #	Levelland	Pampa	Knox City
9013187	137*	106	265
9013188	149	92	270
9028147	134	72	262
9022822	117	53	209
9029494	139	63	246
9028148	173	82	273
9028146	167	52	264

*Measurements in inches

Summary: Since 1992 multiple selections were being collected at the PMC and produced at the Texas Forest Service (TFS) Nursery in Lubbock. In 2005 after reviewing the possibility of releasing 477964, a plant fact sheet on little walnut was published in 2006 and the study closed.

Study: 48I156H Evaluation of *Calamovilfa gigantea*, giant sandreed

Objective: Evaluate an assembly of giant sandreed and select a superior plant to primarily aid in vegetative sand stabilization needs. Secondary use is revegetation of critically eroding areas.

Supplement #1 – From the initial evaluation study, the top five accessions were selected for further evaluation. Accession 42911 did not survive in the evaluation study. The four surviving accessions were combined and given the accession 9065015 after the evaluation study and moved to the initial seed increase. Here are the overall results in its duration of evaluation study.

Accession	% Stand	Vigor	Stage-Early Greenup	Spread Vegetatively	Vigor/Density	% Survival
35710	3	3	1	5	7	7
35879	3	3	1	3	3	7
35810	5	3	1	5	3	5
42928	1	3	1	1	1	3
42911	0	0	0	0	0	0

Rating: 1-Excellent / 3-Good / 5-Fair / 7-Poor / 9-Very Poor / 0-None

35710-Dickens Co., TX
35879-Childress Co., TX
35810-Wilbarger Co., TX
42928-Childress Co., TX
42911-Winkler Co., TX – Did not survive and not in composite

Polycross Study

9065015 Giant sandreedgrass
North End

D	C	D	
C	H	C	A
D	A	H	C
A	D	C	B
B	C	A	C

South End

A =
Acid 4 plants
B =
Heat 2 plants
C =
Cold 7 plants
D = Salt 4 plants
*H =
Heat 2 plants
Total 19 plants

Transplant at 6' centers within rows
Transplant at 80" apart between rows

Transplant on 6/4/2007; D - Block
*Transplants are Texas 99
Heat

Summary: Continue with seed harvest in the initial seed increase of accession 9065015, until a substantial amount of seeds are in storage for future field plantings and a future select release. A polycross study was done on 9065015 giant sandreed seeds. This included germination, acid, heat, cold, and salt test. The seedlings which survived the test are transplanted at the JEBSPMC for further evaluation.

Study: 48I171K Evaluation of *Lonicera albiflora*, white honeysuckle

Objective: To evaluate an assembly of white honeysuckle as a windbreak, shelterbelt, and wildlife plant for Central and West Texas. Should one or more accessions prove superior these selections will be evaluated in FEP testing.

Project Plan – In the spring of 1986 a collection of White honeysuckle were planted and in 1988 notes were taken and project was discontinued and replaced with another collection of white honeysuckle. Spring of 1992 of the 32 accessions planted only eighteen accessions germinated for transplanting for IEP. In the summer of 1993 for the first evaluation, only 9 accessions survived. Following are results of 1994 to 2000 evaluations.

Accn Number	Stand	Drought Tolerance	Winter Recovery
64871-Taylor Co., TX	2	1	1.5
49576-Brown Co., TX	2	1	1.5
64869-Burnet Co., TX	5	1	1.5
9008239-Schleicher Co., TX	5	1	2
64868*-Lampasas Co., TX	7	1	3
49511-Sutton Co., TX	7	1	3
64872-Taylor Co., TX	1	1	1.5
49601*-Nolan Co., TX	8	9	7.5
64885*-Lampasas Co., TX	8	9	8
SUM	45.00	25.00	29.50
MEAN	5.0000	2.7778	3.2778

Rating: (1-Best and 9-Worst); *Plants not alive

Summary: Only six accessions are still alive in the IEP block as of FY 2006. The six surviving are 64871, 64869, 64872, 49576, 9008239, and 49511. Leave the remaining six accessions as a composite for seed collection and a future release. JEBSPMC developed a Plant Fact Sheet for white honeysuckle.

Study: 48I179B Native Plants for Big Bend National Park

Introduction

The original agreement with Big Bend National Park and the James E. "Bud" Smith Plant Materials Center (PMC) was developed and signed in 1989. Early agreements involve seed and/or plant collection at the Park and seed increase at the PMC. Materials produced were used for roadside revegetation within the park. Plant materials (seeds) were drilled and/or broadcast along road shoulders following construction. The first agreement was completed in 1993. The second agreement scheduled for completion in 1997 was modified to incorporate an additional study to look at techniques for road slope revegetation. In 1998 an additional agreement was put into place to provide materials for the next phase of road construction. This agreement originally scheduled from 1998 - 2001 was amended in 1999 and placed on hold through 2001, pending the rescheduling of construction activities. Currently there are no active agreements targeting roadside revegetation projects.

In 2001 a new agreement was prepared between the Park and PMC addressing the need to revegetate areas after removal of invasive plants. The park has funded this agreement from 2001 thru 2005.

Accomplishments:

Since 1989 nine different species have been produced for the park and three species evaluated to determine production and propagation techniques.
At the end of 2005, the park had received a total of 2742 bulk pounds of seed totaling 1188 PLS lbs. No seeds were delivered in the year of 2006.

Seed Production and Available Inventory

Common Name	Area(ac)	2006 Prod./Lbs *	PLS Inventory On Hand
Alkali sacaton	-	-	332.70
Sideoats grama	-	-	104.66
Green sprangletop	-	-	114.20
Cane bluestem	.50	65*	64.91
Showy menodora	-	-	118.10
Whiplash pappusgrass	.28	49.5*	15.93
Chino grama	-	-	13.78
Tobosa	.11	2.2*	-
Limoncillo	-	-	-

* Bulk lbs

Conclusion:

At the end of FY 2005 seed production fields being maintained and harvested included cane bluestem, Chino grama, tobosagrass, and whiplash pappusgrass. The agreement signed in 2001 addressing post weed control revegetation has been modified to run into 2006.

Study: 48I183B Native Plants for Chickasaw National Recreation Area

Introduction

The agreement between the NPS/Chickasaw National Recreation Area from Sulphur, Oklahoma and the NRCS/James E. 'Bud' Smith Plant Materials Center from Knox City, Texas was developed and signed in 1990. The first through the fifth phase were for revegetating of the Buckhorn Area, the Guy Sandy Area, the Veterans Lake Area, the Point Campground, and the Point/Perimeter Roads which were completed by 2003. The sixth phase of the project, which was tree transplants for the Tree Park Wide Area completed by 2003. The phase one through two included native grass seeds and woody plants. The phase three through five included seed production of native grasses, forbs, legumes, and several shrub/woody transplants. Phase six included several different native woody plants for tree transplants for the Tree Park Wide Area. All native plant seeds and woody material were collected from the Park and increased and/or propagated at the Plant Materials Center near Knox City, Texas and delivered to the Park.

Accomplishments

From 1993 to 2003 the Park received a total of 1,383.43 bulk pounds of native forbs and grass seeds totaling 854.26 PLS lbs. and 6,628 shrub and woody transplants. They consisted of American and winged elm, black willow, blackjack oak, coralberry, Carolina buckthorn, buttonbush, bur oak, chinkapin oak, Chickasaw plum, cottonwood, eastern redbud, green ash, hackberry, post oak, red oak, roughleaf dogwood, sycamore, smooth and winged sumac, persimmon, Mexican plum, skunkbush sumac, Virginia creeper, and white honeysuckle.

Seed Production Inventory Jan. - Dec. 2006

Common Names	Units	2006 Production	Total PLS - On Hand
sideoats grama	1.0 ac.	130.50*	41.51 PLS
hairy grama	0 ac.	0	.79 PLS
big bluestem	.25 ac.	.4*	0 PLS
little bluestem	.225 ac.	7.50*	4.11 PLS
Indiangrass	.50 ac.	1*	42.36 PLS
purpletop	.24 ac.	12.25*	26.78 PLS
wildrye sp.	0 ac.	0	1.84 PLS
buffalograss	200 sq. ft.	0	1*
purple coneflower	0 ac.	0	.19*
Mexican hat	0 ac.	0	.24*
Indian blanket	0 ac.	0	.14*
black-eyed Susan	0 ac.	0	.24*
gayfeather	0 ac.	0	.34*

*Bulk lbs

Conclusion: Before the end of fiscal year 2003 the agreements were fulfilled. The PMC will maintain the grass seed production fields for future seeding in the Park with new agreements.

Study: 48I187J Evaluation of *Abutilon fruticosum*, sweet Indianmallow

Objective: To evaluate an assembly of sweet Indianmallow and select a superior plant to primarily enhance water quality, for improvement of range and pastureland, and to promote food and cover for wildlife.

Initial Evaluations between 1992 – 2000

Accn #	Emergence	Survival	Vigor	Stand	EarlyBlooms	FreezeRecv.	DroughtToler.
49534 Williamson Co.	6	1.5	5.8	3	5	5	1
49539 Caldwell Co.	4	2	5.3	2	5	4	1
49542 Guadalupe Co.	8	2.5	6	5	6	5	1
49544-Bell Co.	5	4.5	5.5	7	6	5	1
49553-Bell Co.	7	3	5.3	5	5	5	1
49559-Palo Pinto Co.	3	2	5.5	4	5	5	1
49560-Parker Co.	2	2.5	5.5	3	5	5	1
49561-Williamson Co.	5	2	4.8	2	5	4	1
49564-Burnet Co.	6	2.5	6.3	5	6	5	1
49567-McLennan Co.	7	7.5	6.8	8	5	7	1
49578-Schleicher Co.	5	2.5	4.5	2	5	4	1
49589-Real Co.	5	2	5.5	3	5	6	1
49590-Coryell Co.	6	2.5	6	7	5	5	1
49599-Lampasas Co.	8	1.5	5.8	5	4	5	1
49609-Callahan Co.	6	2.5	6	6	5	5	1
49618-Llano Co.	8	1	7	9	9	9	1
49621-Menard Co.	8	1.5	6	8	6	6	1
49623-Concho Co.	8	3	5.8	6	5	5	1
49630-Williamson Co.	7	2.5	5.5	1	5	2	1
49631-Caldwell Co.	8	2.5	4.3	3	6	4	1
64849-Lampasas Co.	9	9	9	9	9	9	9
64850-Lampasas Co.	8	3.5	6.3	5	5	5	1
64853-Bell Co.	6	2	6	3	5	5	1
64856-Burnet Co.	8	5	6.3	8	6	6	1
64857-Burnet Co.	6	4	6.3	4	4	5	1
64858-Burnet Co.	8	1.5	5.8	8	6	5	1
64859-Coleman Co.	2	1.5	5.5	4	5	4	1
64862-Refugio Co.	7	5	4.8	7	6	5	1
64870-Bell Co.	3	1	5.3	4	4	4	1
64878-Coryell Co.	5	2.5	6	4	4	5	1
64883-Gonzales Co.	7	1	5	3	6	5	1
64889-Guadalupe Co.	8	2	6.3	6	6	6	1
64891-Brown Co.	4	2.5	5.8	6	5	6	1
64893-Schleicher Co.	6	2.5	5.5	3	4	4	1
SUM	209	94.5	197.1	168	183	175	42
MEAN	6	2.5	5.8	5	5	5	1

Ratings (1-Best and 9-Worst)

Summary: In 2000 collected the seeds from all existing accessions from initial plots and blend seeds for initial seed increase. The initial evaluation plots were plowed on 3/4/02. The seeds from 34 accessions were composite for initial seed increase and given the accession number 9093014.

Study: 48I188S Evaluation of *Calylophus serrulatus*, halfshrub sundrop

Objective: To evaluate an assembly of halfshrub sundrop and select a superior plant to primarily enhance water quality, improvement of range and pastureland and to promote food and cover for wildlife. Secondary uses are ground cover vegetation for critically eroding areas to reduce soil loss and improve water quality.

Project Plan: In May 17, 1993 transplanted 35 accessions for Initial Evaluation. In the seven years of growing, observation, and three years of evaluation during the seven years, these are the accessions that survived through drought and limited rainfall.

Accession	Drought	Vigor	% Stand	Early Bloom	Freeze Recovery
64934-Bell Co., TX	1	8.5	9	9	9
64916-Comanche Co., TX	1	6.5	5	6	6
64958-Childress Co., TX	1	6	8	3	3
64865-Lipscomb Co., TX	1	6	5	5	5
49629-King Co., TX	1	3	4	4	4
64959-Montague Co., TX	1	6	4	5	5
64863-Lipscomb Co., TX	1	4.5	5	2	3
64932-Mc Lennan Co., TX	1	5.5	3	5	4
SUM	8	46	43	39	39
MEAN	1	6	5	5	4.5

Rating (Best-1 and Worst-9)

Summary: The plots were removed in 2000. Due to the foreseen problem associated with seed production (indeterminate inflorescence) and harvest could be a problem with this plant species. JEBSPMC developed a Plant Fact Sheet for this plant species.

Study: 48I190S Evaluation of *Panicum havardii*, Havard panicum

Objective: To evaluate an assembly of Havard panicum and select a superior plant to primarily aid in cultural techniques for saline and/or alkaline soil conditions and for stabilizing sandy soils that have high erosion potential.

Project Plan: In the fall of 1998, seeds from the 11 accessions in the IEP were collected, combined and given a new accession number of 9065020. In May of 1999 the accession 9065020 was planted for initial seed increase. Following are results for the individual accessions following five years of evaluation and observation.

Accession	Stand	Early-Stage of Bloom	Vigor	Freeze Recovery
9049593Crane Co., TX	2	6.5	5.5	4
9049592-Crane Co., TX	7	5.5	5	4
9003951-Winkler Co., TX	8	4	4.5	4
9049287-Andrews Co., TX	2	5	7	4
9064960-Crane Co., TX	7	5	5.5	4
9001480-Old Composite	4	4	4.5	4
9064950-Andrews Co., TX	3	5	5.5	4
9004621-Andrews Co., TX	4	4	6.5	4
9049541-Crane Co., TX	3	4	5	4
9064880-Ward Co., TX	6	5	5.5	4
9064890-Crane Co., TX	7	6	5.5	4
SUM	53	54	60	44
MEAN	4	5	5.5	4

Rating (1-Best and 9-Worst)

Summary: Currently, accession #9065020 in initial seed increase has some switchgrass contaminated in the plot. JEBSPMC will continue to harvest accession #9065020 and clean field eliminating the switchgrass from the Havard panicum field.

Study: 48I192S Evaluation of *Acacia angustissima,* prairie acacia

Objective: To evaluate an assembly of prairie acacia and select a superior plant for improvement of range, promote food and cover for wildlife and provide ground cover vegetation for critically eroding areas to reduce soil erosion and improve water quality.

Project Plan: In May of 1997 transplanted 17 accessions into initial evaluation planting. Following are results from the past five years of evaluations.

Accession Number	Drought	Seed Prod	Vigor
9049624– Frio Co., TX	1	6	1
9064978 – King Co., TX	1	6	1
9049620– Runnels Co., TX	1	6	1
9049617– Crockett Co., TX	1	1	1
9064926 – Austin Co., TX	1	1	1
9064928– Lee Co., TX	1	4	1
9064965– Haskell Co., TX	1	1	1
9064952– DeWitt Co., TX	1	3	1
9064922– Coke Co., TX	1	1	1
9064970– Callahan Co., TX	1	1	1
9064972 – Bell Co., TX	1	1	1
9064924– Grimes Co., TX	1	1	1
9064921– Taylor Co., TX	1	1	1
9064915– Hamilton Co., TX	1	1	1
9049622– Schleicher Co., TX	1	6	1
9064933– Bell Co., TX	1	2	1
9064917– Comanche Co., TX	1	1	1
SUM	17	43	17
MEAN	1	2.52941	1

Rating: (Best-1 and Worst-9)

Summary: On 5/29/03 planted the 17 accessions as a composite for initial seed increase. Through IEP evaluation and observation all accessions perform excellent as far as drought tolerance, vigor, robust, and early green-up. The new accession number given is 9085672 for all seventeen accessions composite. Anticipate to release as a select germplasm in 2008.

Study: 48I193S: Technical Evaluation of *Spartina pectinata*, prairie cordgrass

Objective: To evaluate selected assemblies of prairie cordgrass for use in water quality improvement and for re-vegetation of saline and/or alkaline soil conditions.

Project Plan: In 1997, 3 accessions of prairie cordgrass were planted in 2 replications for comparison. From the duration of the study and in the end of 2005 a final summary was developed to complete this project. Here are the results:

Accession Number	Drought Tolerant	Seed Potential	Winter Recovery	Ability to Spread-Veg.
9064975	5	9	1	9
9064974	1	3	1	7
434434	5	9	1	3

Rating: 1-Excellent / 3-Good / 5-Fair / 7-Poor / 9-Very Poor / 0-None

9064975-Lipscomb Co., Texas
9064974-Donley Co., Texas
434434-Hutchinson Co., Texas

Summary: Project on hold, until further notice from the Plant Materials Technical Committee.

Study: 48I195S Evaluation of *Andropogon glomeratus*, bushy bluestem

Objective: To evaluate selected assemblies of bushy bluestem for use in water quality improvement and for revegetation of saline and/or alkaline areas and riparian corridors.

Project Plan: In May of 1998 ten accessions were transplanted into IEP. By 2002 these ten accessions did not survive. Another collection was made and potted in the greenhouse for IEP. These are the results.

Accessions	Seed Potential	Vigor	Most Seedheads
9085640	1	1	5
9085643	7	5	1
9085642	5	1	5
9085632	5	7	9
9065040	7	7	1
9065034	0	3	7
9085631	0	5	5
9085646	0	0	3

Rating: 1-Excellent / 3-Good / 5-Fair / 7-Poor / 9-Very Poor / 0-None

9085640 – Kaufman Co., Texas
9085643 – Palo Pinto Co., Texas
9085642 – Parker Co., Texas
9085632 – Limestone Co., Texas
9065040 – Burnet Co., Texas
9065034 – Bell Co., Texas
9085631 – Limestone Co., Texas
9085646 – Panola Co., Texas

Summary: JEBSPMC will put project on hold until further notice from Plant Materials Technical Committee. Need to develop a plant fact sheet for this species. Stored seeds on some of these accessions in the climate control seed room at the Center for future study.

Study: 48I196S Evaluation of *Tridens flavus*, purpletop

Objective: Re-evaluate purpletop for use in water quality improvement, vegetative filter strips and re-vegetation of critically eroded areas. There are 25 accessions from new seed collections planted in containers, but only 24 germinated on February 2004 for IEP Study. They were transplanted in RCB with three replications on July 2004. In 2005 they were evaluated overall on these guidelines.

Accessions	% Stand	Vigor	Maturity as of 9/14/05
9085630	5	5	7
9065036	3	5	5
9085627	3	3	9
9085626	3	5	7
9085656	3	9	5
9085633	5	5	9
9085639	5	9	9
9065048	5	5	7
9065046	3	5	9
9065003	3	9	3
9065047	3	5	9
9085628	3	3	9
9085644	3	5	7
9065032	3	1	9
9065033	1	7	1
9065039	5	7	3
9085638	3	5	7
9085645	3	5	9
9085636	3	7	7
9064986	3	3	9
9085637	5	7	5
9085635	3	3	9
9085634	3	7	3
9065038	5	9	5

Rating: 1-Excellent / 3-Good / 5-Fair / 7-Poor / 9-Very Poor / 0-None

9085630 – Burleson Co., Texas
9065036 – Mills Co., Texas
9085627 – Brazos Co., Texas
9085626 – Hunt Co., Texas
9085656 – Murray Co., Oklahoma
9085633 – Panola Co., Texas
9085639 – Grayson Co., Texas
9065048 – Hunt Co., Texas
9065046 – Limestone Co., Texas
9065003 – Montague Co., Texas
9065047 – Kaufman Co., Texas
9085628 – Brazos Co., Texas
9085644 – Taylor Co., Texas
9065032 – Brazos Co., Texas
9065033 – Hemphill Co., Texas
9065039 – Burnet Co., Texas
9085638 – Grayson Co., Texas
9085645 – Lampasas Co., Texas
9085636 – Parker Co., Texas
9064986 – Gonzales Co., Texas
9085637 – Johnson Co., Texas
9085635 – Nacogdoches Co., Texas
9085634 – Montague Co., Texas
9065038 – Milam Co., Texas

Summary: Collect seeds from each accession and replication to do a polycross study in the near future.

Study: 48I202J Nutritional Evaluation of Perennial Species for White-tailed Deer Food Plots

Objective: The Plant Materials Center has released several improved forbs, legumes, and woody shrubs that can be used in the establishment of perennial food plots. Although known to be nutritious and beneficial, additional site and animal use data was needed. In 1998 four sites were established in prominent white-tailed deer management areas. The data compiled from the evaluation of this study will be used to make additional recommendations on the establishment and usage of perennial plants used in deer food plots and as a basis for future cultivar development and enhancement.

Sites established included:

- TPWD - Kerr Wildlife Management Area - Hunt, TX
- North Concho River Ranch - San Angelo, TX
- Scott Ranch - Beeville, TX
- Cherry Creek Ranch - Comfort, TX

Select species established at each site:

- 'Eldorado' Engelmanndaisy
- 'Plateau' awnless bushsunflower
- 'Sabine' Illinois bundleflower
- 'Yellow Puff" littleleaf leadtree
- 'Comanche' partridge pea
- 'Aztec' Maximilian sunflower

Summary: In year 2005 the site at Kerr WMA is established and giving some data. All sites have had trouble with establishment due to drought conditions the past years. A technical note will be developed on using perennial plants for food plot.

Study: TXPMC-T-0601-RA Growth Curve Study

Objective: To provide information on forage and nutritive quality distribution of native, perennial, warm-season grass cultivars and selections under low and high fertility management.

Project Plan: In spring of 2006 seeded perennial grass species in 7 feet x 32 feet plots replicated 3 times and each plot subdivided into eight, 3.5 feet x 8 feet quadrants. Quadrants with assigned monthly clippings will occur from April through November for three years starting in spring of 2007.

Growth Curve Study
Plot Layout

West Side

Rep 1 **Low Fertility**	Rep 2 **Low Fertility**	Rep 3 **High Fertility**
Alamo	Upland switchgrass	Haskell
Earl	Haskell	Alamo
Select 75	Select 75	Lometa
San Marcos	Earl	San Marcos
Haskell	Lometa	Upland switchgrass
Upland switchgrass	San Marcos	Earl
Lometa	Alamo	Select 75
High Fertility	**High Fertility**	**Low Fertility**
Upland switchgrass	Haskell	Earl
San Marcos	Alamo	San Marcos
Select 75	Earl	Lometa
Haskell	Upland switchgrass	Select 75
Lometa	Lometa	Alamo
Alamo	San Marcos	Upland switchgrass
Earl	Select 75	Haskell

East Side

Grass Entry:
'Alamo' switchgrass, 'Earl' big bluestem, 'Lometa' Indiangrass, 'Selection 75' kleingrass, 'San Marcos' eastern gamagrass, 9065018 switchgrass (upland type), and 'Haskell' sideoats grama.

Summary: Spring of 2007 harvested the quadrant plots with assigned monthly clippings. Anticipate results at the end of each year.